In the claims:

1. (Currently amended) A method of forming an interconnect structure comprising the steps of:

providing a lower electrical contact including a lower interconnect member;

depositing an ILD and forming an interconnect aperture therein extending down to make contact with said lower interconnect member;

depositing a liner layer in said interconnect aperture;

removing said liner layer on at least the bottom surface of said interconnect aperture, thereby exposing a top surface of said lower interconnect member;

bombarding said top surface of said lower interconnect member with ions such that material is removed from the interface of said lower interconnect member and the bottom surface of said interconnect aperture in a generally cone shape having a height greater than the radius, thereby forming a second aperture within said lower interconnect member having a shape with substantially no horizontal surfaces; and

depositing conductive material in said interconnect aperture, thereby establishing a joint between said lower interconnect member and an upper interconnect member formed by said conductive material in said interconnect aperture.

2. (Canceled)

3. (Previously presented) A method according to claim 1, in which the material of said lower interconnect member is selected from the group consisting of Cu, W, Al, and other conducting materials.

4. (Currently amended) A method according to claim 1, in which the material of said liner layer deposited in said interconnect structure ~~on the ILD~~ is selected from the group consisting of TaN, Ta, Ti, Ti(Si)N and W.

5. (Previously presented) The method of claim 1, wherein a gas source for ion bombardment is selected from the group consisting of Ar, He, Ne, Xe, N_2, H_2, NH_3, N_2H-2.

6. (Canceled)

7. (Canceled)

8. (Currently amended) A method of forming an interconnect structure comprising the steps of:

providing a lower electrical contact including a lower interconnect member;

depositing an ILD and forming an interconnect aperture therein extending down to make contact with said lower interconnect member;

depositing a liner layer in said interconnect aperture;

removing said liner layer on at least the bottom surface of said interconnect aperture, thereby exposing a top surface of said lower interconnect member;

bombarding said top surface of said lower interconnect member with ions such that material is removed from the interface of said lower interconnect member and the bottom surface of said interconnect aperture ~~A method according to claim 1, in which said step of removing material from said lower interconnect member removes said material~~ in a generally cone shape having a height greater than or equal to $(3)^{0.5}$ times a radius, thereby

forming a second aperture within said lower interconnect member having a shape with substantially no horizontal surfaces; and

depositing conductive material in said interconnect aperture, thereby establishing a joint between said lower interconnect member and an upper interconnect member formed by said conductive material in said interconnect aperture.

9. to 24. (Canceled)